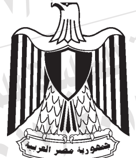
جمهورية مصر العربية



وزارة التربية والتعليم
والتعليم الفني

نموذج إجابة

امتحان شهادة إتمام الدراسة الثانوية العامة

للعام الدراسى ٢٠١٧/٢٠١٦ ـ الدور الأول

المـادة : التفاضل والتكامل (باللغة الفرنسية)

نموذج

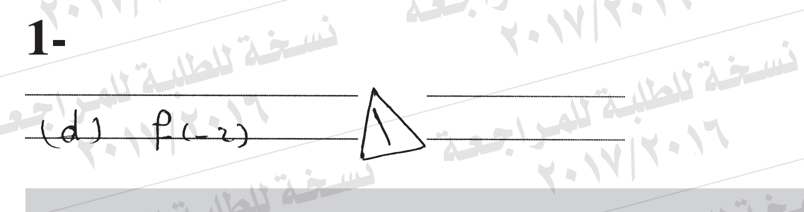
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الأسئلة من — إلى	الدرجة
١ — ٥	٧
٦ — ٨	٥
٩ — ١٢	٦
١٣ — ١٦	٧
١٧ — ١٨	٥
المجموع	٣٠

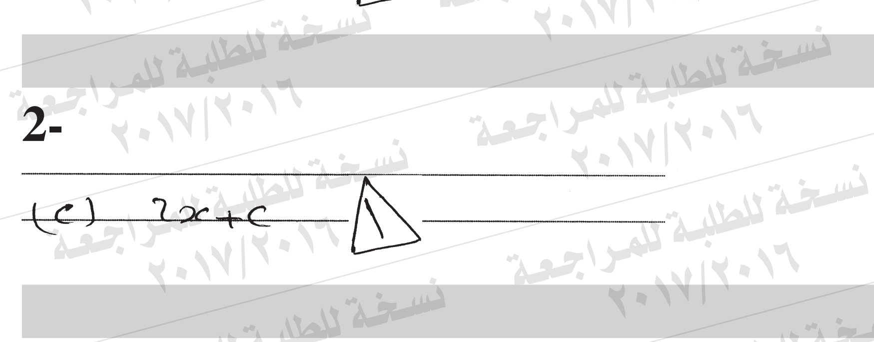
لكل مجموعة مقدر ومراجع



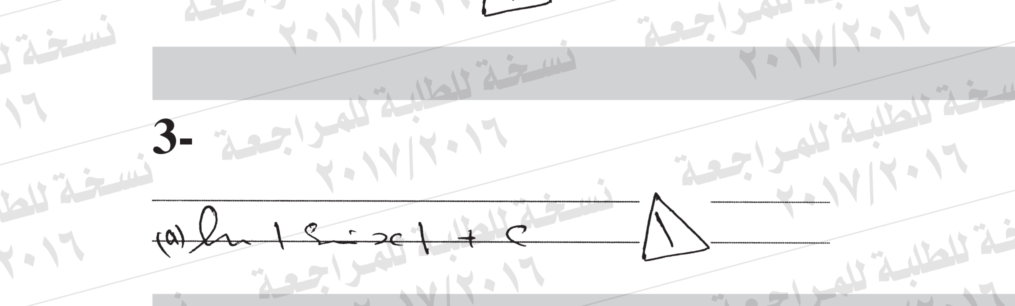
1-



2-



3-



4-

$\because y = 3e^{x}$ [1/2]

$y' = 3e^{x}$, at $x = -1$ [1/2]

$\therefore y' = 3e^{-1} = \frac{3}{e}$ [1/2]

$\therefore$ l'équation de la normale

$y - y_1 = \frac{-1}{y'}(x - x_1)$ [1/2]

$y - 3e^{-1} = \frac{-e}{3}(x+1)$ [1/2]

$y = \frac{3}{e} - \frac{ex}{3} - \frac{e}{3}$ [1/2]

5-

(a) $\frac{-11}{4}$ [1]

6-

(C) $-\frac{1}{6}$ 

7-

$x \times y = \frac{Z+1}{Z-1} \times \frac{Z-1}{Z+1} = 1$ $\frac{1}{2}$

$\therefore y = \frac{1}{x} \Rightarrow y = x^{-1} \Rightarrow y' = -x^{-2}$ $\frac{1}{2}$

$\therefore y'' = 2x^{-3}$ ——— ①

Si $Z = 0 \quad \therefore x = -1$ $\frac{1}{2}$

Par Substitution en ① $\frac{d^2y}{dx^2} = 2 \times (-1)^{-3} = -2$ $\frac{1}{2}$

Autre Solution $\frac{dx}{dZ} = \frac{Z-1-Z-1}{(Z-1)^2} = \frac{-2}{(Z-1)^2}$

$\frac{dy}{dZ} = \frac{Z+1-Z+1}{(Z+1)^2} = \frac{2}{(Z+1)^2}$ $\frac{1}{2}$

$\therefore \frac{dy}{dx} = \frac{-(Z-1)^2}{(Z+1)^2}$ $\frac{1}{2}$

$\frac{d^2y}{dx^2} = \frac{-2(Z-1)(Z+1)^2 - 2(Z+1)(-(Z-1)^2)}{(Z+1)^4} \times \frac{(Z-1)^2}{-2}$ $\frac{1}{2}$

at $Z=0$ $\frac{d^2y}{dx^2} = \frac{(-2)(-1)(1) - (2)(1)(-1)}{1} \times \frac{1}{-2} = -2$ $\frac{1}{2}$

8-

$A = \pi r^2$ $\frac{1}{2}$

$\frac{dA}{dt} = 2\pi r \times \frac{dr}{dt}$ $\frac{1}{2}$

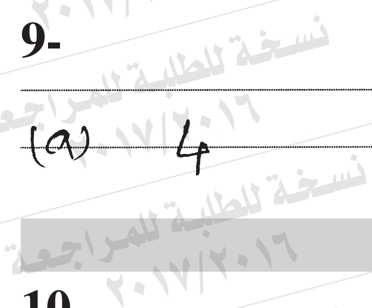
après 5 secondes $\Rightarrow r = 4 \times 5 = 20$ cm $\frac{1}{2}$

$\therefore \frac{dA}{dt} = 2\pi \times 20 \times 4$

$= 160\pi$ cm²/s $\frac{1}{2}$



9-


(a) 4

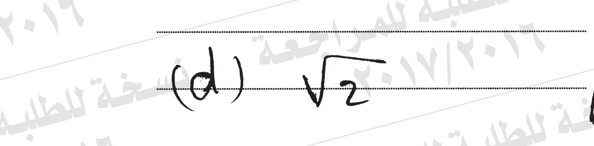

1

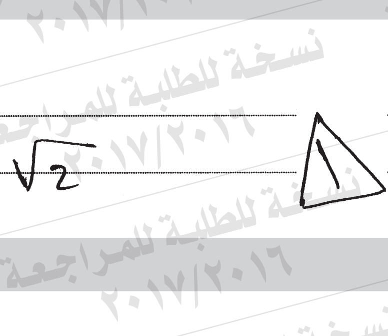
10-

(b) $-\frac{1}{4}$


1

11-


(d) $\sqrt{2}$


1

12-

(a) L'ensemble de définition de la fonction est $\mathbb{R}$

$f(x) = (2-x)e^x$

$f'(x) = -e^x + (2-x)e^x$ $\frac{1}{2}$

on pose $f'(x) = 0 \Rightarrow -e^x + (2-x)e^x = 0$ $\frac{1}{2}$

$-1 + 2 - x = 0 \Rightarrow x = 1$ $\frac{1}{2}$

$f''(x) = -e^x + (-e^x) + (2-x)e^x$

$= -2e^x + (2-x)e^x$ $\frac{1}{2}$

$f''(1) = -2e + e = -e < 0$ $\frac{1}{2}$

$\therefore$ Il y a une valeur maximale relative quand $x = 1$ est e $\frac{1}{2}$

(b) $f(x) = 3x^4 - 4x^3$

$f'(x) = 12x^3 - 12x^2$ $\frac{1}{2}$

$12x^2(x-1) = 0$

$x = 0$ ou $x = 1$ $\frac{1}{2}$

$f(0) = 3 \times 0^4 - 4 \times 0^3 = 0$

$f(1) = 3 \times 1^4 - 4 \times 1^3 = -1$ 1

$f(-1) = 3 \times (-1)^4 - 4(-1)^3 = 7$

$f(2) = 3 \times (2)^4 - 4(2)^3 = 16$

$\therefore$ la valeur minimal est -1 $\frac{1}{2}$ et la valeur maximal est 16 $\frac{1}{2}$

13-

(a) $x + \frac{1}{2} \sin 2x + C$ (1)

14-

Soit $OA = x$;
$OB = y$ (1/2)

$\therefore AD = x - 3$

$\because \triangle DAC \sim \triangle OAB$

donc $\frac{x-3}{x} = \frac{2}{y}$ (1/2)

$\therefore y = \frac{2x}{x-3}$

L'aire du $\triangle OAB = \frac{1}{2} x y$

$= \frac{1}{2} x \times \frac{2x}{x-3}$ (1/2)

(A) L'aire du $\triangle OAB = \frac{x^2}{x-3}$

$A' = \frac{2x(x-3) - x^2}{(x-3)^2}$ (1/2)

au plus petite Aire $\Rightarrow A' = 0$

$2x^2 - 6x - x^2 = 0$

$x^2 - 6x = 0 \Rightarrow x = 0$ ou $x = 6$ (1/2)

$\therefore$ L'aire est plus petite quand $x = 6$

la plus petite Aire $= \frac{6^2}{6-3} = 12$ unité d'aire (1/2)

15-

(٥) ٤ ⟨1⟩

16-

les points d'intersectio

$x^2 = 5x$

$x^2 - 5x = 0$

$x = 0$ ou $x = 5$ ⟨$\frac{1}{2}$⟩

$l'aire = \int_0^5 |x^2 - 5x| \, dx$ ⟨$\frac{1}{2}$⟩

$= \left| \frac{x^3}{3} - \frac{5x^2}{2} \right|_0^5$ ⟨$\frac{1}{2}$⟩

$= \left| \frac{125}{3} - \frac{125}{2} \right| = \left| -\frac{125}{6} \right|$

donc $l'aire = \frac{125}{6}$ unité d'aire. ⟨$\frac{1}{2}$⟩

17-

Les points d'intersection

$x^2 = 3x \Rightarrow x^2 - 3x = 0$ (1/2)

$\Rightarrow x(x-3) = 0 \Rightarrow x = 0$ ou $x = 3$ (1/2)

$V = \pi \int_0^3 |x^4 - 9x^2| \, dx$ (1/2)

$= \pi \left| \frac{x^5}{5} - 3x^3 \right|_0^3$ (1/2) $= \pi \left| \frac{3^5}{5} - 3 \times 3^3 \right|$ (1/2)

$= \frac{162}{5} \pi$ unité de volume (1/2)

18-

(a) $= \int \frac{x+1-1}{x+1} \, dx$ (1/2)

$= \int \left(1 - \frac{1}{1+x}\right) dx$ (1/2)

$= x - \ln|x+1| + c$ (1)

(b) $= \int x^2 \ln x \, dx$

$= \frac{1}{3} x^3 \ln x - \frac{1}{3} \int x^2 \, dx$ (1) [$\ln x$ (+) x^2 ; $\frac{1}{x}$ (−) $\frac{x^3}{3}$]

$= \frac{1}{3} x^3 \ln x - \frac{1}{9} x^3 + c$ (1)

(انتهت الإجابة وتراعى الحلول الأخرى)